

Baseline Assessment – Stream Attributes

Reach S-B34 (Pipeline ROW) Perennial Spread C Webster County, West Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Perennial stream (not shadeable, slope <4%)
RBP Physical Characteristics Form	✓
Water Quality Data	✓ Readings from benthic sampling date
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	✓ Sample collected 9/15/22
Wolman Pebble Count	✓
Reference Reach Software Pebble Count Data	✓
Longitudinal Profile and Cross Sections	✓



Photo Type: DS. US VIEW
Location, Orientation, Photographer Initials: Downstream at ROW Upstream View, SK, HC, JB
Lat: 38.493956 Long: -80.56099



Photo Type: DS, DS VIEW
Location, Orientation, Photographer Initials: Downstream at ROW Downstream View, SK, HC, JB
Lat: 38.493956 Long: -80.56099



Photo Type: CL US

Location, Orientation, Photographer Initials: On thalweg at pipe centerline Upstream View, SK, HC, JB
Lat: 38.493956 Long: -80.56099



Photo Type: CL, DS

Location, Orientation, Photographer Initials: On thalweg at pipe centerline Downstream View, SK, HC, JB
Lat: 38.493956 Long: -80.56099



Photo Type: US, US VIEW

Location, Orientation, Photographer Initials: Upstream at ROW Upstream View, SK, HC, JB
Lat: 38.493956 Long: -80.56099



Photo Type: US, DS VIEW

Location, Orientation, Photographer Initials: Upstream at ROW Downstream View, SK, HC, JB
Lat: 38.493956 Long: -80.56099



Photo Type: RIFFLE DS VIEW

Location, Orientation, Photographer Initials: Upstream at ROW looking downstream, SK, HC, JB

Lat: 38.493956 Long: -80.56099

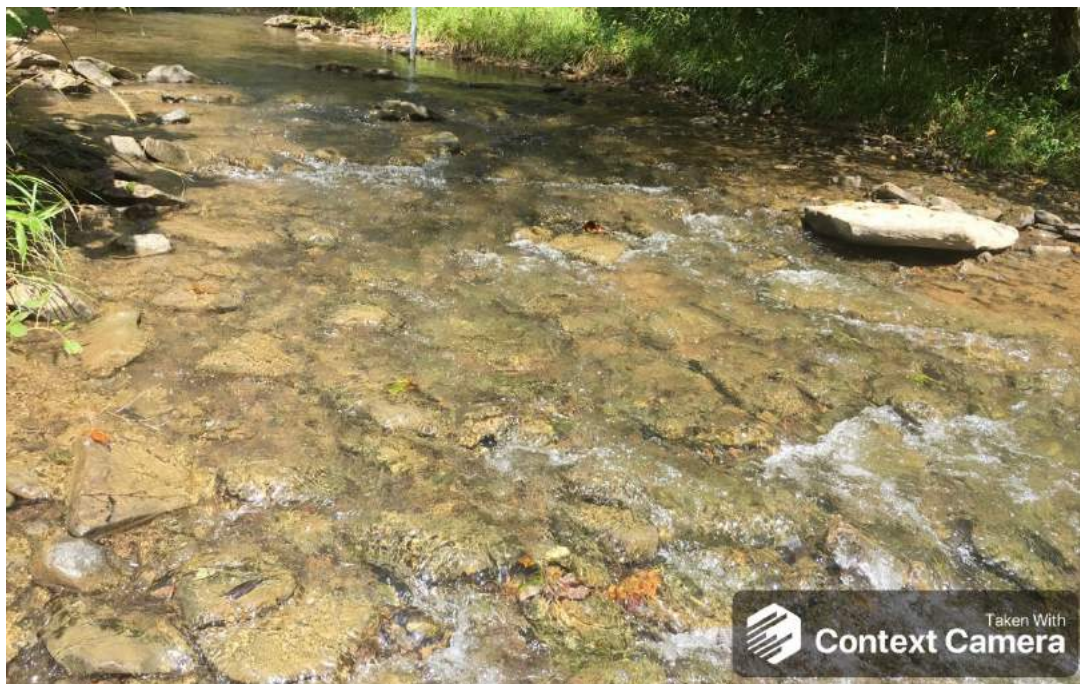


Photo Type: RIFFLE US VIEW

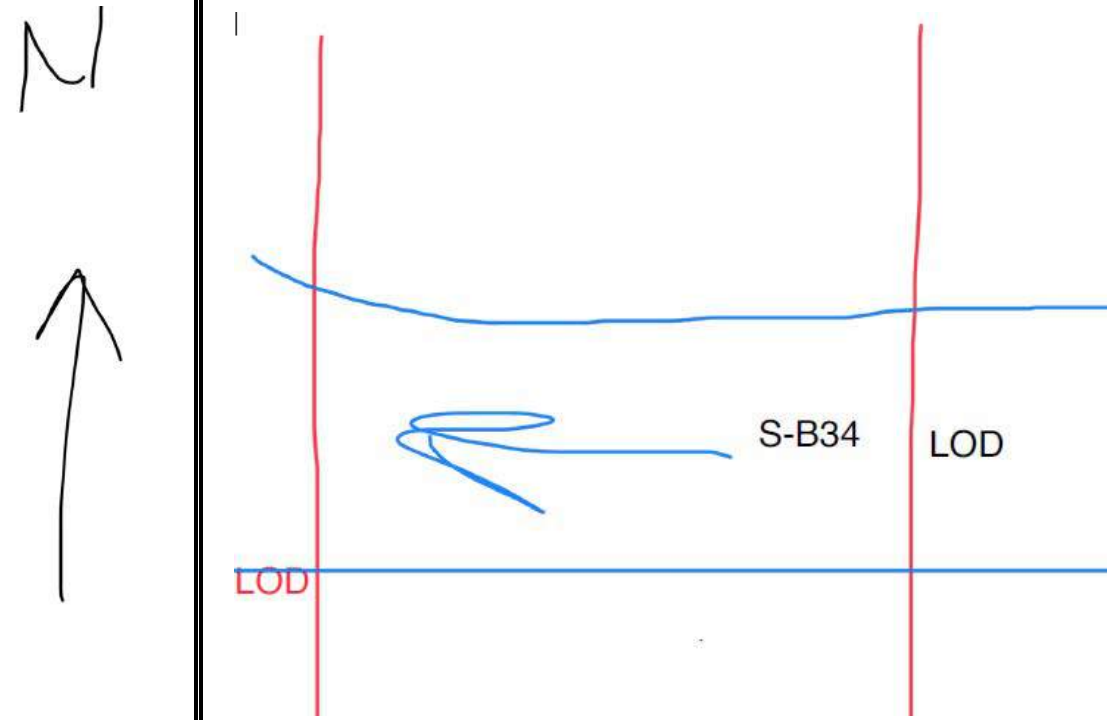
Location, Orientation, Photographer Initials: Upstream at ROW looking downstream, SK, HC, JB

Lat: 38.493956 Long: -80.56099

USACE FILE NO./ Project Name:		Mountain Valley Pipeline		IMPACT COORDINATES:		Lat.		38.493956		Lon.		-80.56099		WEATHER:		Sunny		DATE:		9/15/2021			
IMPACT STREAM/SITE ID AND SITE DESCRIPTION:				S-B34 Pipeline ROW				MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION:				Comments:											
(watershed size (acreage), unaltered or impairments)								(watershed size (acreage), unaltered or impairments)															
STREAM IMPACT LENGTH:		81		FORM OF MITIGATION:		RESTORATION (Levels I-III)		MIT COORDINATES:		Lat.		Lon.		PRECIPITATION PAST 48 HRS:				Mitigation Length:					
Column No. 1- Impact Existing Condition (Debit)				Column No. 2- Mitigation Existing Condition - Baseline (Credit)				Column No. 3- Mitigation Projected at Five Years Post Completion (Credit)				Column No. 4- Mitigation Projected at Ten Years Post Completion (Credit)				Column No. 5- Mitigation Projected at Maturity (Credit)							
Stream Classification:		Perennial		Stream Classification:				Stream Classification:		0		Stream Classification:		0		Stream Classification:		0		Stream Classification:		0	
Percent Stream Channel Slope		1.1		Percent Stream Channel Slope				Percent Stream Channel Slope		0		Percent Stream Channel Slope		0		Percent Stream Channel Slope		0		Percent Stream Channel Slope		0	
HGM Score (attach data forms):				HGM Score (attach data forms):				HGM Score (attach data forms):				HGM Score (attach data forms):				HGM Score (attach data forms):							
		Average				Average				Average				Average				Average				Average	
Hydrology				Hydrology				Hydrology				Hydrology				Hydrology				Hydrology			
Biogeochemical Cycling		0		Biogeochemical Cycling		0		Biogeochemical Cycling		0		Biogeochemical Cycling		0		Biogeochemical Cycling		0		Biogeochemical Cycling		0	
Habitat				Habitat				Habitat				Habitat				Habitat							
PART I - Physical, Chemical and Biological Indicators				PART I - Physical, Chemical and Biological Indicators				PART I - Physical, Chemical and Biological Indicators				PART I - Physical, Chemical and Biological Indicators				PART I - Physical, Chemical and Biological Indicators							
PHYSICAL INDICATOR (Applies to all streams classifications)				PHYSICAL INDICATOR (Applies to all streams classifications)				PHYSICAL INDICATOR (Applies to all streams classifications)				PHYSICAL INDICATOR (Applies to all streams classifications)				PHYSICAL INDICATOR (Applies to all streams classifications)							
USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)							
1. Epifaunal Substrate/Available Cover		0-20		1. Epifaunal Substrate/Available Cover		0-20		1. Epifaunal Substrate/Available Cover		0-20		1. Epifaunal Substrate/Available Cover		0-20		1. Epifaunal Substrate/Available Cover		0-20		1. Epifaunal Substrate/Available Cover		0-20	
2. Embeddedness		0-20		2. Embeddedness		0-20		2. Embeddedness		0-20		2. Embeddedness		0-20		2. Embeddedness		0-20		2. Embeddedness		0-20	
3. Velocity/Depth Regime		0-20		3. Velocity/Depth Regime		0-20		3. Velocity/Depth Regime		0-20		3. Velocity/Depth Regime		0-20		3. Velocity/Depth Regime		0-20		3. Velocity/Depth Regime		0-20	
4. Sediment Deposition		0-20		4. Sediment Deposition		0-20		4. Sediment Deposition		0-20		4. Sediment Deposition		0-20		4. Sediment Deposition		0-20		4. Sediment Deposition		0-20	
5. Channel Flow Status		0-20		5. Channel Flow Status		0-20		5. Channel Flow Status		0-20		5. Channel Flow Status		0-20		5. Channel Flow Status		0-20		5. Channel Flow Status		0-20	
6. Channel Alteration		0-20		6. Channel Alteration		0-20		6. Channel Alteration		0-20		6. Channel Alteration		0-20		6. Channel Alteration		0-20		6. Channel Alteration		0-20	
7. Frequency of Rifles (or bends)		0-20		7. Frequency of Rifles (or bends)		0-20		7. Frequency of Rifles (or bends)		0-20		7. Frequency of Rifles (or bends)		0-20		7. Frequency of Rifles (or bends)		0-20		7. Frequency of Rifles (or bends)		0-20	
8. Bank Stability (LB & RB)		0-20		8. Bank Stability (LB & RB)		0-20		8. Bank Stability (LB & RB)		0-20		8. Bank Stability (LB & RB)		0-20		8. Bank Stability (LB & RB)		0-20		8. Bank Stability (LB & RB)		0-20	
9. Vegetative Protection (LB & RB)		0-20		9. Vegetative Protection (LB & RB)		0-20		9. Vegetative Protection (LB & RB)		0-20		9. Vegetative Protection (LB & RB)		0-20		9. Vegetative Protection (LB & RB)		0-20		9. Vegetative Protection (LB & RB)		0-20	
10. Riparian Vegetative Zone Width (LB & RB)		0-20		10. Riparian Vegetative Zone Width (LB & RB)		0-20		10. Riparian Vegetative Zone Width (LB & RB)		0-20		10. Riparian Vegetative Zone Width (LB & RB)		0-20		10. Riparian Vegetative Zone Width (LB & RB)		0-20		10. Riparian Vegetative Zone Width (LB & RB)		0-20	
Total RBP Score		Suboptimal		Total RBP Score		Poor		Total RBP Score		Poor		Total RBP Score		Poor		Total RBP Score		Poor		Total RBP Score		Poor	
Sub-Total		0.745		Sub-Total		0		Sub-Total		0		Sub-Total		0		Sub-Total		0		Sub-Total		0	
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)				CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)				CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)				CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)				CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)							
WVDEP Water Quality Indicators (General)				WVDEP Water Quality Indicators (General)				WVDEP Water Quality Indicators (General)				WVDEP Water Quality Indicators (General)				WVDEP Water Quality Indicators (General)							
Specific Conductivity		750-999 - 30 points		Specific Conductivity		750-999 - 30 points		Specific Conductivity		750-999 - 30 points		Specific Conductivity		750-999 - 30 points		Specific Conductivity		750-999 - 30 points		Specific Conductivity		750-999 - 30 points	
pH		7.50-8.50 = 45 points		pH		7.50-8.50 = 45 points		pH		7.50-8.50 = 45 points		pH		7.50-8.50 = 45 points		pH		7.50-8.50 = 45 points		pH		7.50-8.50 = 45 points	
DO		>5.0 = 30 points		DO		>5.0 = 30 points		DO		>5.0 = 30 points		DO		>5.0 = 30 points		DO		>5.0 = 30 points		DO		>5.0 = 30 points	
Sub-Total		0.525		Sub-Total		0		Sub-Total		0		Sub-Total		0		Sub-Total		0		Sub-Total		0	
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)							
WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)							
Fair		0.100		Fair		0.100		Fair		0.100		Fair		0.100		Fair		0.100		Fair		0.100	
Sub-Total		0.343		Sub-Total		0		Sub-Total		0		Sub-Total		0		Sub-Total		0		Sub-Total		0	
PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score							
Index		Linear Feet		Index		Linear Feet		Index		Linear Feet		Index		Linear Feet		Index		Linear Feet		Index		Linear Feet	
0.538		81		0		0		0		0		0		0		0		0		0		0	
Unit Score		43.551		Unit Score		0		Unit Score		0		Unit Score		0		Unit Score		0		Unit Score		0	

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME _____	LOCATION _____	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS _____		
FORM COMPLETED BY _____	DATE _____ TIME _____	REASON FOR SURVEY _____

WEATHER CONDITIONS	Now storm (heavy rain) _____ rain (steady rain) _____ showers (intermittent) _____ %cloud cover _____ clear/sunny _____	Past 24 hours _____%	Has there been a heavy rain in the last 7 days? Yes No Air Temperature _____ °C Other _____
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) 		
STREAM CHARACTERIZATION	Stream Subsystem Perennial Intermittent Tidal Stream Origin Glacial Spring-fed Non-glacial montane Mixture of origins Swamp and bog Other _____		
	Stream Type Coldwater Warmwater Catchment Area _____ km ²		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse Forest Field/Pasture Agricultural Residential Commercial Industrial Other _____	Local Watershed NPS Pollution No evidence <input type="checkbox"/> Some potential sources Obvious sources Local Watershed Erosion None Moderate Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present Trees Shrubs Grasses Herbaceous Dominant species present _____	
INSTREAM FEATURES	Estimated Reach Length _____ m Estimated Stream Width _____ m Sampling Reach Area _____ m ² Area in km ² (m ² x1000) _____ km ² Estimated Stream Depth _____ m Surface Velocity _____ m/sec (at thalweg)	Canopy Cover Partly open Partly shaded Shaded High Water Mark _____ m Proportion of Reach Represented by Stream Morphology Types Riffle _____ % Run _____ % Pool _____ % Channelized Yes No Dam Present Yes No
LARGE WOODY DEBRIS	LWD _____ m ² Density of LWD _____ m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present Rooted emergent Rooted submergent Rooted floating Free floating Floating Algae Attached Algae Dominant species present _____ Portion of the reach with aquatic vegetation _____ %	
WATER QUALITY (DS, US)	Temperature _____ °C Specific Conductance _____ Dissolved Oxygen _____ pH _____ Turbidity _____ WQ Instrument Used _____	Water Odors Normal/None Sewage Petroleum Chemical Fishy Other _____ Water Surface Oils Slick Sheen Globes Flecks None Other _____ Turbidity (if not measured) Clear <input type="checkbox"/> Slightly turbid Turbid Opaque Stained Other _____
SEDIMENT/SUBSTRATE	Odors Normal Sewage Petroleum Chemical Anaerobic None Other _____ Oils Absent Slight Moderate Profuse Deposits Sludge Sawdust Paper fiber Sand Relict shells Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? Yes No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET - HG - USE ON ALL STREAMS (FRONT)

STREAM NAME		LOCATION	
STATION # _____ RIVERMILE _____		STREAM CLASS	
LAT _____ LONG _____		RIVER BASIN	
STORET #		AGENCY	
INVESTIGATORS			
FORM COMPLETED BY		DATE _____ TIME _____ AM PM	REASON FOR SURVEY

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).			
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.			
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)			
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.			
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.			
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.					Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.					Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.					Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.					
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
Note: determine left or right side by facing downstream.																					
SCORE ____ (LB)	Left Bank	10	9			8	7	6			5	4	3			2	1	0			
SCORE ____ (RB)	Right Bank	10	9			8	7	6			5	4	3			2	1	0			
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE ____ (LB)	Left Bank	10	9			8	7	6			5	4	3			2	1	0			
SCORE ____ (RB)	Right Bank	10	9			8	7	6			5	4	3			2	1	0			
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE ____ (LB)	Left Bank	10	9			8	7	6			5	4	3			2	1	0			
SCORE ____ (RB)	Right Bank	10	9			8	7	6			5	4	3			2	1	0			

Total Score _____

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-B34	LOCATION Webster County	
STATION # _____ RIVERMILE _____	STREAM CLASS Perennial	
LAT 38.493956 LONG -80.56099	RIVER BASIN None	
STORET # _____	AGENCY WVDEP	
INVESTIGATORS MB, DH	LOT NUMBER _____	
FORM COMPLETED BY MB	DATE 9/15/22 TIME 16:00	REASON FOR SURVEY Baseline Assessment

HABITAT TYPES	Indicate the percentage of each habitat type present <input checked="" type="checkbox"/> Cobble 40% <input type="checkbox"/> Snags _____% <input type="checkbox"/> Vegetated Banks _____% <input type="checkbox"/> Sand _____% <input type="checkbox"/> Submerged Macrophytes _____% <input type="checkbox"/> Other (_____) _____%
SAMPLE COLLECTION	Gear used <input type="checkbox"/> D-frame <input checked="" type="checkbox"/> kick-net <input type="checkbox"/> Other _____ How were the samples collected? <input checked="" type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat Indicate the number of jabs/kicks taken in each habitat type. <input checked="" type="checkbox"/> Cobble 4 <input type="checkbox"/> Snags _____ <input type="checkbox"/> Vegetated Banks _____ <input type="checkbox"/> Sand _____ <input type="checkbox"/> Submerged Macrophytes _____ <input type="checkbox"/> Other (_____) _____
GENERAL COMMENTS	US: Temp: 19.9C SPC:760US/CM DO:9.3mg/L PH:8.23 DS: Temp: 19.9C SPC:767US/CM DO:9.17mg/L PH:8.27

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

SITE ID:	S-B34
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9/15/2021

Insects	Count	Tolerance	TV	Insects	Count	Tolerance	TV	Non-Insects	Count	Tolerance	TV			
Ephemeroptera				Odonata				Crustacea						
Ameletidae		2	0	Aeshnidae		3	0	Asellidae		7	0			
Baetidae		4	0	Calopterygidae		6	0	Cambaridae		5	0			
Beatisidae		4	0	Coenagrionidae		7	0	Gammaridae		5	0			
Caenidae	1	5	5	Cordulegastridae		3	0	Palaemonidae		5	0			
Ephemerellidae		3	0	Gomphidae	1	5	5	Annelida						
Ephemeridae		5	0	Lestidae		7	0	Hirudinea		10	0			
Heptageniidae	2	3	6	Libellulidae		7	0	Nematoda		10	0			
Isonychiidae		3	0	Coleoptera				118	Nematomorpha		10	0		
Leptophlebiidae		4	0	Chrysomelidae		7	0	Oligochaeta		10	0			
Potamanthidae		5	0	Dryopidae		5	0	Turbellaria						
Siphonuridae		3	0	Dytiscidae		6	0	Turbellaria		7	0			
Tricorythidae		5	0	Elmidae	107	4	428	Bivalvia						
Plecoptera				Gyrinidae					5	0	Corbiculidae		6	0
Capniidae		2	0	Halplidae		7	0	Sphaeriidae		5	0			
Chloroperlidae		2	0	Hydrophilidae		7	0	Unionidae		4	0			
Leuctridae		2	0	Psephenidae	11	3	33	Gastropoda						
Nemouridae		2	0	Ptilodactylidae		5	0	Ancylidae		7	0			
Peltoperlidae		1	0	Hemiptera				1	Hydrobiidae		4	0		
Perlidae	5	1	5	Belostomatidae		8	0	Physidae		7	0			
Perlodidae		1	0	Corixidae		8	0	Planorbidae		5	0			
Pteronarcyidae		1	0	Gerridae	1	10	10	Pleuroceridae		5	0			
Taeniopterygidae		2	0	Hydrometridae		8	0	Viviparidae		5	0			
Trichoptera				Nepidae					8	0	Miscellaneous			
Brachycentridae		2	0	Notonectidae		8	0	Collembola		6	0			
Glossosomatidae		2	0	Megaloptera				3	Lepidoptera		5	0		
Helicopsychidae		3	0	Corydalidae	1	3	3	Neuroptera		5	0			
Hydropsychidae	9	5	45	Sialidae	2	6	12	Hydrachnidae		6	0			
Hydroptilidae		3	0	Diptera				77	Totals					
Lepidostomatidae		3	0	Athericidae		3	0	Total number		218				
Leptoceridae		3	0	Blephariceridae		2	0	Total families		13				
Limnephilidae		4	0	Ceratopogonidae		8	0	Metric calculations						
Molannidae		3	0	Chironomidae	69	9	621	WVSCI Metric Scores			Additional metrics			
Philopotamidae	1	4	4	Culicidae		10	0	Total Taxa	13	59.1	Ephemeroptera Taxa	2		
Phryganeidae		4	0	Dixidae		6	0	EPT Taxa	5	38.5	Plecoptera Taxa	1		
Polycentropodidae		5	0	Empididae	8	7	56	% EPT Abundance	8.3	9.2	Trichoptera Taxa	2		
Psychomiidae		4	0	Psychodidae		8	0	% Chironomidae	31.7	69.5	Long-lived Taxa	8		
Rhyacophilidae		3	0	Ptychopteridae		8	0	Hilsenhoff Biotic Index (HBI)	5.66	58.8	Odonata Taxa	1		
Uenoidae		2	0	Simuliidae		7	0	% 2 Dominant Taxa	80.7	30.7	Diptera Taxa	2		
Total Tolerance Value			1233	Stratiomyidae		10	0					% Sensitive	9.2	
West Virginia Stream Condition Index (WVSCI)				Syrphidae		10	0	WV Stream Condition Index			% Tolerant		35.8	
Gerritson, J., J. Burton, and M.T. Barbour. 2000. A stream condition index for West Virginia wadeable streams. Tetra Tech, Inc. Owing Mills, MD.				Tabanidae		7	0				% Clingers		57.3	
				Tipulidae		5	0				% Net-spinners		4.6	

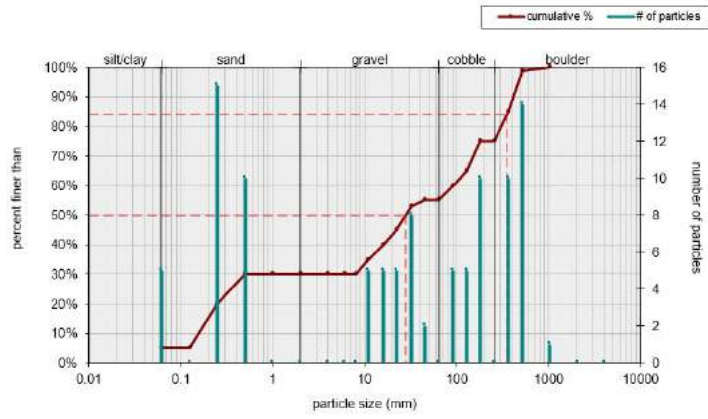
Spreadsheet uses updated Best Standard Values [BSV] for each metric per WVSCI Addenda dated March 23, 2010

WOLMAN PEBBLE COUNT FORM

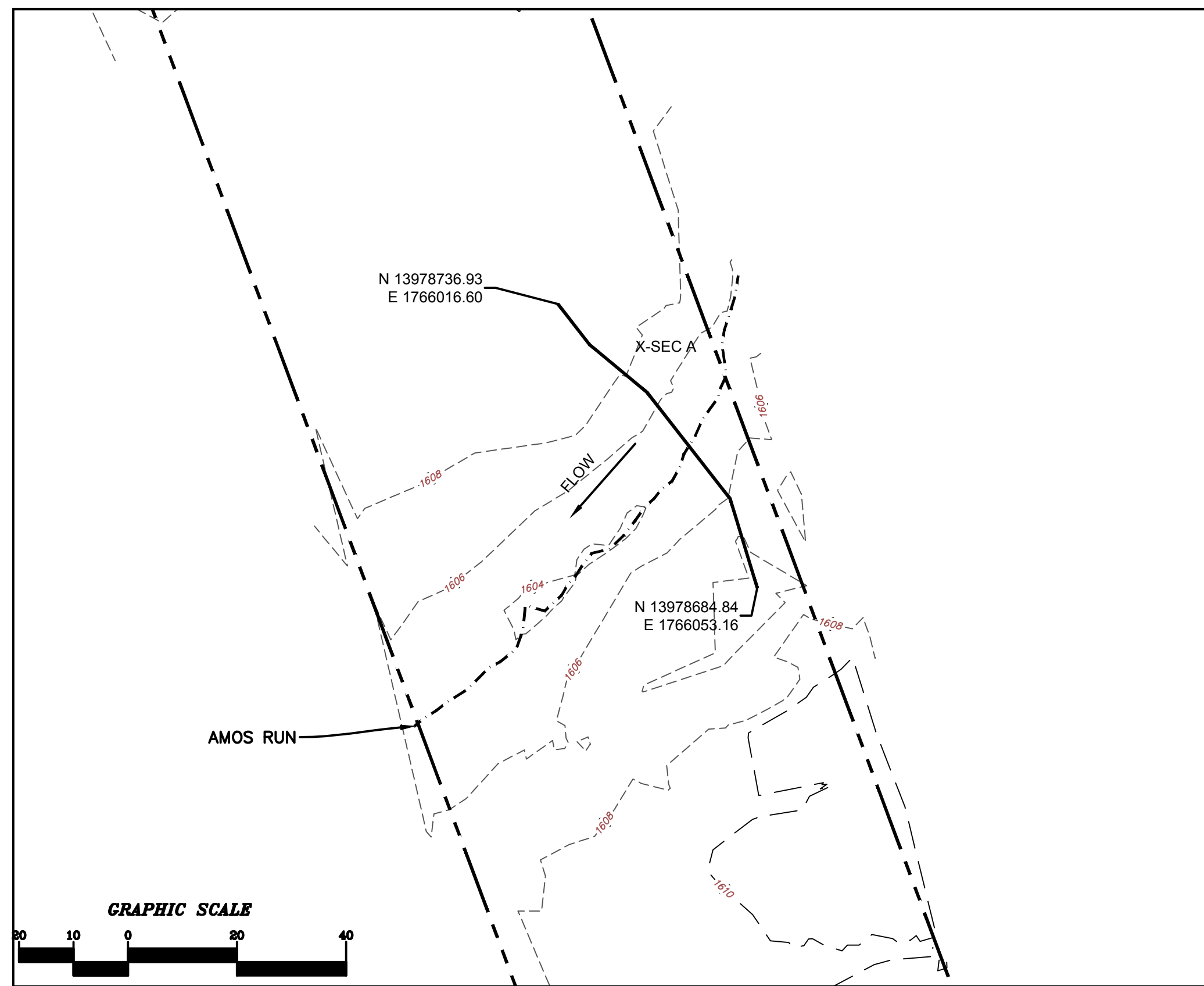
County: Webster Stream ID: S-B34
 Stream Name: Amos Run
 HUC Code: Basin:
 Survey Date: 9/9/2021
 Surveyors: SK JB HC Impact: 24.99
 Type: Bankfull Channel

PEBBLE COUNT							
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cum
	Silt/Clay	< .062	S/C	▲ ▼	5	5.00	5.00
	Very Fine	.062-.125	S A N D	▲ ▼	0	0.00	5.00
	Fine	.125-.25		▲ ▼	15	15.00	20.00
	Medium	.25-.5		▲ ▼	10	10.00	30.00
	Coarse	.50-1.0		▲ ▼	0	0.00	30.00
.04-.08	Very Coarse	1.0-2		▲ ▼	0	0.00	30.00
.08-.16	Very Fine	2-4		G R A V E L	▲ ▼	0	0.00
.16-.22	Fine	4-5.7	▲ ▼		0	0.00	30.00
.22-.31	Fine	5.7-8	▲ ▼		0	0.00	30.00
.31-.44	Medium	8-11.3	▲ ▼		5	5.00	35.00
.44-.63	Medium	11.3-16	▲ ▼		5	5.00	40.00
.63-.89	Coarse	16-22.6	▲ ▼		5	5.00	45.00
.89-1.26	Coarse	22.6-32	▲ ▼		8	8.00	53.00
1.26-1.77	Vry Coarse	32-45	▲ ▼		2	2.00	55.00
1.77-2.5	Vry Coarse	45-64	▲ ▼		0	0.00	55.00
2.5-3.5	Small	64-90	C O B B L E	▲ ▼	5	5.00	60.00
3.5-5.0	Small	90-128		▲ ▼	5	5.00	65.00
5.0-7.1	Large	128-180		▲ ▼	10	10.00	75.00
7.1-10.1	Large	180-256		▲ ▼	0	0.00	75.00
10.1-14.3	Small	256-362	B O U L D E R	▲ ▼	10	10.00	85.00
14.3-20	Small	362-512		▲ ▼	14	14.00	99.00
20-40	Medium	512-1024		▲ ▼	1	1.00	100.00
40-80	Large	1024-2048		▲ ▼	0	0.00	100.00
80-160	Vry Large	2048-4096		▲ ▼	0	0.00	100.00
	Bedrock		BDRK	▲ ▼	0	0.00	100.00
				Totals:	100		
	Total Tally:						

Bankfull Channel Pebble Count, S-B34



Size (mm)	Size Distribution	Type			
D16	0.21	mean	8.6	silt/clay	5%
D35	11	dispersion	72.9	sand	25%
D50	28	skewness	-0.29	gravel	25%
D65	130			cobble	20%
D84	350			boulder	25%
D85	460				



S-B34

GRAPHIC SCALE

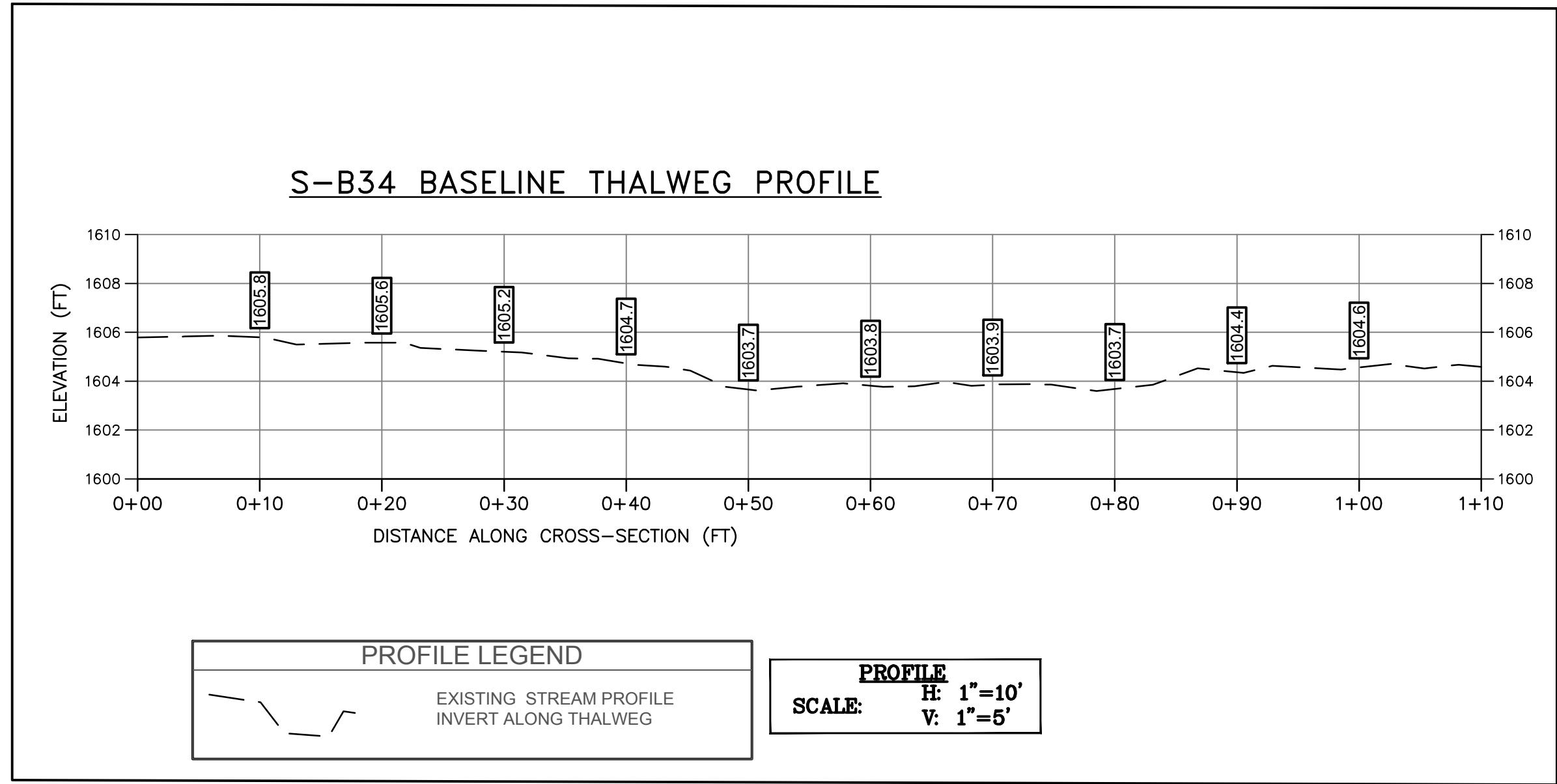
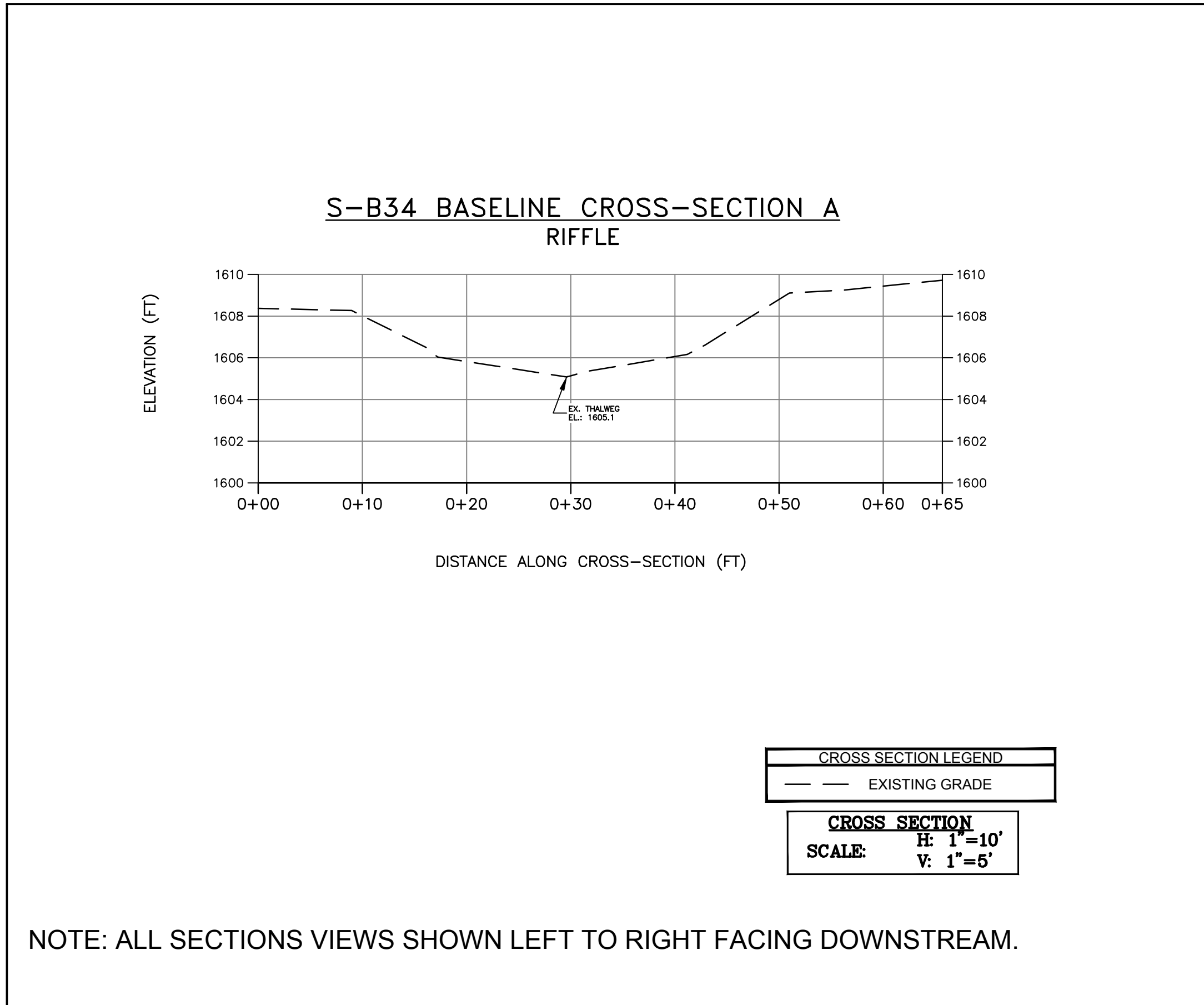


LEGEND

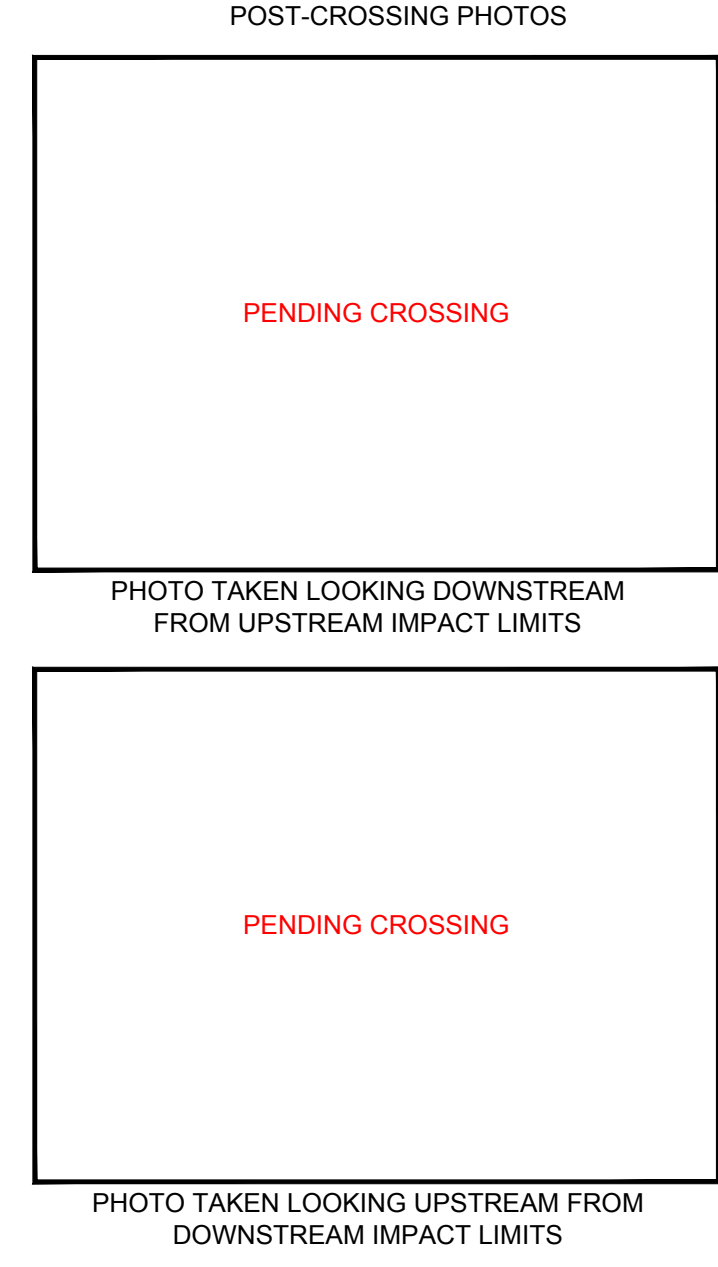
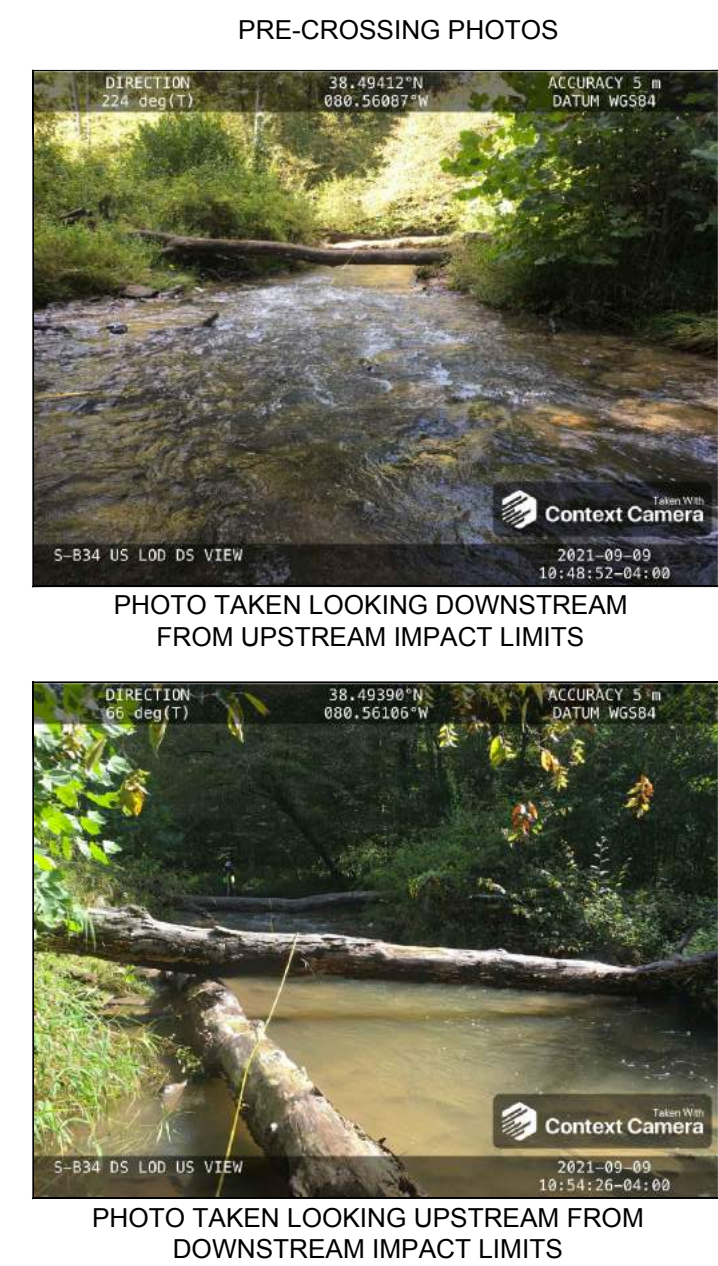
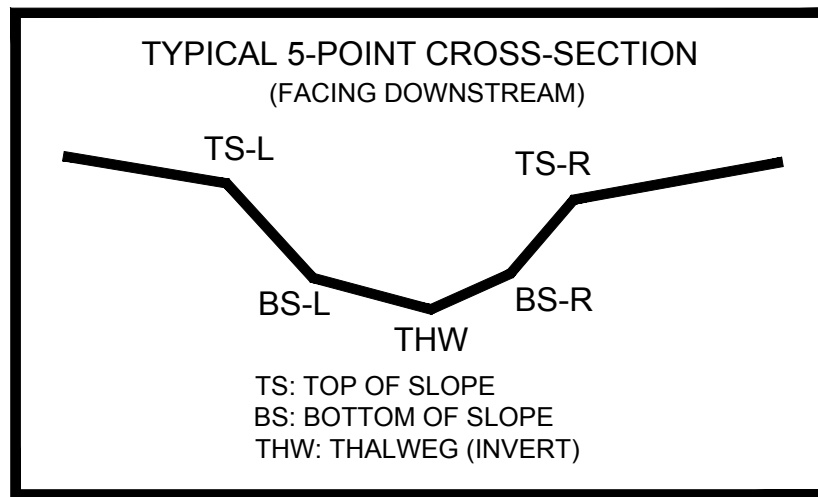
STUDY AREA (EASEMENT)
 EXISTING SURVEY-LOCATED THALWEG
1176.87 + EXISTING SURVEYED GROUND SHOT ELEVATION

SURVEY NOTES:

1. THIS MAP HAS BEEN ORIENTED TO NAD 1983 UTM ZONE 17N, AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), USING REAL TIME DGPS. FIELD LOCATIONS WERE COMPLETED ON SEPTEMBER 9, 2021.
2. EASEMENT LINES SHOWN ON PLAN VIEW WERE PROVIDED BY MOUNTAIN VALLEY PIPELINE.
3. SURVEY POINTS FOR CROSS SECTIONS AND THALWEG PROFILES COLLECTED IN 2021 HAVE BEEN USED IN COMBINATION WITH SURVEY POINTS COLLECTED PREVIOUSLY IN 2020 IN ORDER TO GENERATE THE PRE-CROSSING SURFACE SHOWN IN PLAN. DUE TO NATURAL EROSIONAL STREAM PROCESSES THAT CAN OCCUR OVER TIME, MINOR ADJUSTMENTS TO THE PROFILE ALIGNMENTS MAY HAVE BEEN REQUIRED IN ORDER TO GENERATE A CLEAN PRE-CROSSING SURFACE.
4. ALL SECTION VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.
5. POST-CROSSING SURVEY INFORMATION SHOWN IN RED. DATA PENDING.
6. POST-CROSSING SURVEY POINTS FOR CROSS SECTIONS AND THALWEG ARE PROJECTED ONTO PRE-CROSSING SECTION AND PROFILE VIEWS FOR COMPARISON.



AS-BUILT TABLE: S-B34 CROSS SECTION A					
PT. LOC.	PRE-CROSSING			AS-BUILT	
	NORTHING	EASTING	ELEV.	VERT. DIFF.	HORZ. DIFF.
TS-L	13978694.57	1766049.55	1607.92		
BS-L	13978699.99	1766048.25	1606.54		
THW	13978711.29	1766040.89	1605.08		
BS-R	13978720.68	1766032.988	1606.465		
TS-R	13978725.88	1766026.601	1609.02		



PRE-CROSSING

CAD File No. AH Drawn GH Checked DW Approved NOTED Scale: SEPT_2021 Date: 112IC07157 Project No.

TETRA TECH, INC.
 681 ANDERSEN DRIVE POSTER PLAZA 7
 PITTSBURGH, PA 15220
 TEL: (412) 821-7090 FAX: (412) 821-4040
 E-Mail Address: WWW.TETRA TECH.COM

TETRA TECH
www.tetrattech.com

CLIENT: MOUNTAIN VALLEY PIPELINE, LLC
 2200 ENERGY DRIVE, 2ND FLOOR
 CANONSBURG, PA 15317

TITLE: PROFILE AND CROSS-SECTIONS
 BASELINE SURVEY
 CROSSING S-B34 - AMOS RUN (MP 97.65)
 WEBSTER COUNTY, WV

PRELIMINARY

1
DRAWING